# IGSM2 Updates and Progress

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1. *Implementation of automated adjustment of diversions and pumping to meet the urban and agricultural water demand:*
   - This task is completed with the exception of the enforcement of maximum possible diversion and pumping rates.
   - An iterative method is used to adjust water supply.
   - User can choose to adjust only diversions, only pumping or both. If both diversions and pumping are chosen to be adjusted, then diversions are adjusted first. If there is still a shortage of diversions to meet the demand or the pumping is non-zero even if adjusted diversions meet the demand, then the pumping is adjusted next.
   - Each diversion and pumping can be specified for adjustment to meet only the urban water demand, only agricultural demand or both. These specifications can be changed for each diversion and pumping throughout the simulation period.
2. *Modification of the method to compute the stream-groundwater interaction and the solution of system of equations:*
   - During the implementation of automated supply adjustment package, it was realized that the method used to compute stream-groundwater interaction was not robust.

- A new method was implemented. In the new method, stream and groundwater flow equations are fully coupled and they are solved simultaneously using an iterative technique. The nonlinear equations are linearized using Newton-Raphson method and the resulting system of equations is solved using point successive over-relaxation method as opposed to the block successive over-relaxation method used in the previous versions of IGSM2. Stream-groundwater interaction is merely a by-product of the simultaneous solution of stream and groundwater flow equations.
- The new solution method is slower but robust.

**3.** *Reservoir operations and water rights simulation package:*

- This package was received from WRIME. It will be studied and implemented in IGSM2 later.